DISTECH CONTROLS™

Overview

The ECB-203 Series are microprocessor-based programmable controllers designed to control terminal units such as RTUs, FCUs, UVs, HPUs, AHUs, and chilled ceilings. This controller uses the BACnet® MS/TP LAN communication protocol and is BTL®-Listed as BACnet Application Specific Controllers (B-ASC).

This series contains two models as follows: ECB-203 and ECB-253. The ECB-203 series models have various input types including resistance, voltage, and digital-based ones. Moreover, it provides digital, floating, pulse width modulation, and proportional control outputs for valves, heating elements, fans, and lighting applications. The ECB-203 with *environmental protection* has a conformal coating applied to its circuit board for an extra degree of protection for use in humid regions and it is ideal for enclosed roof-top unit applications. The ECB-253 model has a full-color backlit-display and a jog dial for turn and select navigation to access a wide range of internal controller functions: view and override values, view and modify schedules, and tune PID loops with system response graphing.

These controllers work with a wide range of sensors, such as those in the Allure™ EC-Smart-Vue series of communicating room sensors that feature a backlit-display and graphical menus. These sensors are used for indoor temperature measurement, setpoint adjustment, fan speed selection, and occupancy state override. In addition, this controller is Open-to-Wireless™ ready, and when paired with the Wireless Receiver, it works with a variety of wireless battery-less sensors and switches.

Custom program this controller using EC-*gfx*Program through EC-Net^AX™ Pro which is powered by the Niagara^AX Framework®. This allows you to quickly and easily create your own control sequences capable of meeting the most demanding requirements of any engineering specification.

Applications

- Meets the requirements of the following applications:
  - Rooftop Units
  - Fan Coil Units
  - Chilled Ceilings
  - Heat Pumps
  - Unit Ventilators
  - Small Air Handling Units
- Improves energy efficiency when combined with:
  - Motion detectors to automatically adjust a zone's occupancy mode from standby to occupied when presence is detected
  - CO_2 sensors as part of a demand-controlled ventilation strategy that adjusts the amount of fresh air intake according to the number of building occupants
  - Light switches to control both lighting and a room's HVAC occupancy / standby mode setting
- Works with a wide range of wireless battery-less sensors

Features & Benefits

- Use the EC-*gfx*Program's state-of-the-art visual programming wizard to create operation sequences that meet specific engineering specifications. EC-*gfx*Program is accessible through EC-Net^AX Pro which is powered by the Niagara^AX-based management platform.
- Accelerate custom programming development by using pre-built HVAC control sequences supplied with EC-*gfx*Program.
- Available with an optional Wireless Receiver that supports up to 24 wireless inputs, letting you create wire-free installations and use various wireless battery-less sensors and switches.
- With 6 software configurable universal inputs and 8 software configurable outputs, this controller covers all industry-standard HVAC unitary applications.
- Highly accurate universal inputs support thermistors and resistance temperature detectors (RTDs) that range from 0 Ohms to 350 000 Ohms, giving you the freedom of using your preferred or engineer-specified sensors, in addition to any existing ones.
- Rugged hardware Inputs and Outputs eliminate need for external protection components, such as diodes for 12V DC relays.

Model	ECB-203	ECB-203 with Environmental Protection	ECB-253
Points	14-Point Controller	14-Point Controller	14-Point Controller with Color Display
Universal hardware inputs	6	6	6
Allure EC-Smart-Vue sensor[1]	4	4	4
Wireless inputs[2]	24	24	24
15 Vdc Power Supply	■	■	■
Digital (triac) outputs	5	5	5
Universal output	3	3	3
Operator interface: interactive color display to monitor and override controller parameters			■
Environmental Protection (Conformal Coating)		■	

1. A controller can support a maximum of two Allure EC-Smart-Vue models equipped with a CO_2 sensor. The remaining connected Allure EC-Smart-Vue models must be without a CO_2 sensor.
2. All controllers are Open-to-Wireless ready. Available when an optional Wireless Receiver is connected to the controller. Some wireless sensors may use more than one wireless input from the controller.

Recommended Applications

Model	ECB-203	ECB-203 with Environmental Protection	ECB-253
Rooftop Unit	■	■	
2 Pipe Fan Coil	■		■
2 Pipe Fan Coil with Changeover Sensor	■		■
4 Pipe Fan Coil	■		■
Heat Pump Unit	■		■
Unit Ventilator	■		■
Small Air Handling Unit	■		■
Chilled Ceiling	■		■

BACnet Objects List

BACnet Calendar Objects	1
BACnet Schedule Objects	2
BACnet PID Loop Objects	8
BACnet BV Objects	
- Commandable	10
- Non-Commandable	40
BACnet MSV Objects	
- Commandable	10
- Non-Commandable	40
BACnet AV Objects	
- Commandable	25
- Non-Commandable	75

Additional Features & Benefits

Operator Interface
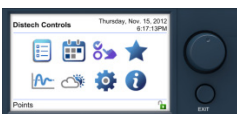
A large color backlit-display that allows an operator to have immediate access to internal controller data.

– View and override values. The status is color coded to show if the value is overridden.
– Visually tune PID loops with system response graphing.
– View and modify schedules and calendars through a graphic interface. Also create or delete schedule events, special events, and calendar entries.
– Create a list of favorites to provide quick access to commonly-used values.
– Multi-User access management.
– Multilingual interface: English, French, German, etc.

Open-to-Wireless Series – Controller Wireless Receiver Add-on

To reduce the cost of installation, and minimize the impact on pre-existing partition walls, the Wireless Receiver enables these controllers to communicate with a line of wireless battery-less room sensors and switches. These Wireless Receivers are available in EnOcean 315MHz and 868.3MHz versions.

Note that controllers have one wireless port to support a single Wireless Receiver.

For more information about the EnOcean and Open-to-Wireless technologies, refer to the Open-to-Wireless Solution Guide. For more information about the Wireless Receiver module, refer to the Wireless Receiver Datasheet. These documents can be found on our web site.

Supported Platforms

EC-Net^{AX} Solution

The EC-Net^{AX} multi-protocol integration solution is web-enabled and powered by the Niagara^{AX} Framework, establishing a fully Internet-enabled, distributed architecture for real-time access, automation and control of devices. The EC-Net^{AX} open framework solution creates a common development and management environment for integration of LONWORKS$^®$, BACnet$^®$ and other protocols. Regardless of manufacturer and protocol, the EC-Net^{AX} system provides a unified modeling of diverse systems and data, providing one common platform for development, management and enterprise applications.

EC-NetAX Wizards

EC-gfxProgram Graphical Programming Interface (GPI)
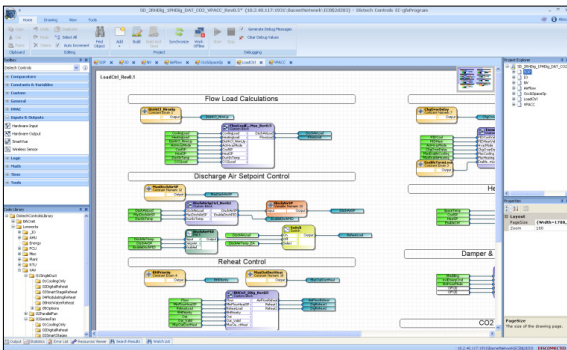
Distech Controls' EC-gfxProgram is a programming tool that allows you to quickly create control sequences by "dragging and dropping" block objects and then linking the objects with a simple "click, select and release". Select objects from an extensive library of over 100 commonly used functions as well as create your own custom blocks. With a user-friendly interface and intuitive programming environment, HVAC programming could not be easier. Refer to the EC-gfxProgram datasheet for more information.

– Program both ECP and ECL Series LonWorks and ECB Series BACnet controllers with the same tool.

– Supplied as freeware – there are no associated licensing costs.

– Live debugging allows user to view code execution, input/output values and to detect errors in real-time.

– A code library for managing your favorite or most commonly used code or code sections.

EC-Net^{AX} Scheduling / EC-gfxProgram EC-Schedule
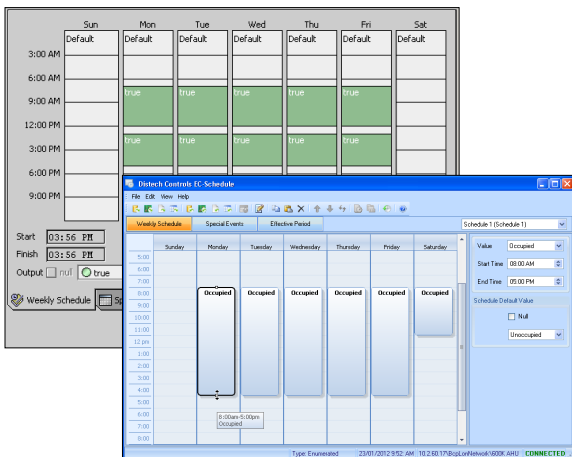
Configure the controller's built-in schedules and holidays from the EC-Net^{AX} solution (ECB and ECL series controllers), or directly from within EC-gfxProgram (ECB and ECL series controllers) with an easy-to-use point, drag, and click interface. It features a weekly schedule for regular, repeating, events by "time-of-day" and "day-of-week", while a holiday schedule is available to define events for specific days.

– Easily configure schedules using a graphical slider.

– Allows you to easily copy and paste entries. Duplicate a schedule entry for Monday to Friday.

– Special events allow you to set exceptions such as holidays to a schedule.

– Holidays can be set for recurring events such as the 9th day, or the 3rd Thursday of a given month.

– A schedule has an effective period during which it is active.

– Schedule provides Next State and Time to Next State that are ideal for use with programming functions such as Optimum Start or Morning Warm Up.

Complementary Products

Temperature Sensors

Allure EC-Smart-Vue Series

Line of communicating room temperature sensors with communication jack, a backlit-display and configurable graphic menus that allow occupants to set occupancy, setpoint adjustment, fan speed, or any other system parameters. Models are available with any combination of the following options: humidity sensor, motion sensor, and CO_2 sensor. The ECO-Vue™ icon (🌱) shows how environmentally-friendly the zone's energy consumption is in real time.

Allure EC-Sensor Series

Line of discrete temperature sensors. Models are available with the following options: communication jack, occupancy override button, setpoint adjustment, and fan speed selection.

Open-to-Wireless Sensors and Switches

Allure Wireless Battery-less ECW-Sensor Series

Line of wireless, battery-less room temperature sensors. Models are available with the following options: occupancy override button, setpoint adjustment, and fan speed selection.

These sensors are available in EnOcean 315MHz and 868.3MHz versions. The controller must be equipped with a Wireless Receiver.
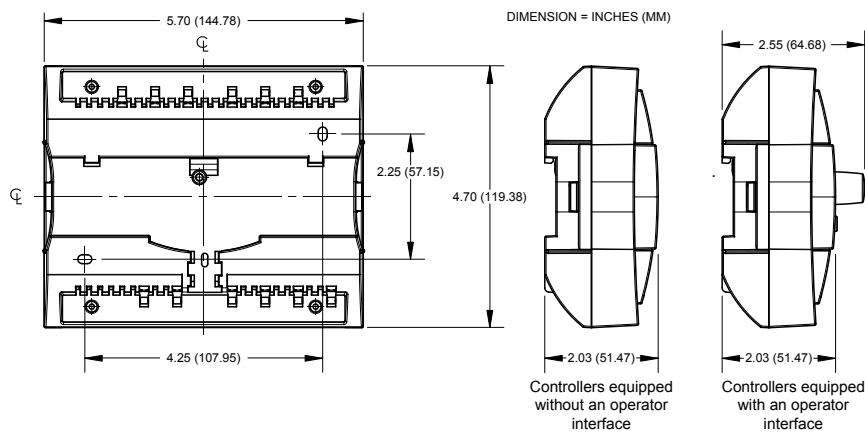
Wireless Sensors and Switches

A wide range of self-powered wireless sensors and switches, including the following: motion detector and light sensor, 2-/4-channel wireless light switches (North American and European models), outdoor temperature sensor, surface temperature contact sensor, duct temperature sensor, and more.

These sensors are available in EnOcean 315MHz and 868.3MHz versions. The controller must be equipped with a Wireless Receiver.

For more information about the available wireless sensors and switches, refer to the Open-to-Wireless Solution Guide which can be found on our web site.

Controller Dimensions

DIMENSION = INCHES (MM)

5.70 (144.78)
2.25 (57.15)
4.70 (119.38)
4.25 (107.95)
2.55 (64.68)
2.03 (51.47)
2.03 (51.47)

Controllers equipped without an operator interface

Controllers equipped with an operator interface

Product Specifications

Power	
Voltage	24VAC/DC; ±15%; 50/60Hz; Class 2
Protection	2.0A user-replaceable fuse
Power Consumption	
- ECB-203	14 VA typical plus all external loads[1], 23 VA max.
- ECB-253	17 VA typical plus all external loads[1], 26 VA max.

Interoperability	
Communication Bus	BACnet MS/TP
BACnet Profile	B-ASC[2]
EOL Resistor	Built-in, jumper selectable
Baud Rates	9600, 19 200, 38 400, or 76 800 bps
Addressing	Dip Switch

Hardware	
Processor	STM32 (ARM Cortex™ M3) MCU, 32 bit
CPU Speed	68 MHz
Memory	384 kB Non-volatile Flash (applications)
	1 MB Non-volatile Flash (storage)
	64 kB RAM
Real Time Clock (RTC)	Built-in Real Time Clock without battery. Network time synchronization is required at each power-up cycle before the RTC becomes available
Status Indicator	Green LEDs: power status & LAN Tx
	Orange LEDs: controller status & LAN Rx
Communication Jack	BACnet 1/8" (3.5mm) stereo audio jack

Environmental	
Operating Temperature	
- ECB-203	-40°F to 158°F; -40°C to 70°C
- ECB-253	32°F to 122°F; 0°C to 50°C
Storage Temperature	-40°F to 158°F; -40°C to 70°C
Relative Humidity	0 to 90% Non-condensing

Enclosure	
Material	ABS type PA-765A
Color	Blue casing & grey connectors
Dimensions	
- ECB-203	5.7 W × 4.7 H × 2.03" D (144.78 × 119.38 × 51.47mm)
- ECB-253	5.7 W × 4.7 H × 2.55" D (144.78 × 119.38 × 64.68mm)
Shipping Weight	
- ECB-203	0.97lbs (0.44kg)
- ECB-253	1.08lbs (0.49kg)
Installation	Direct din-rail mounting or wall mounting through mounting holes (see figure above for hole positions)

Inputs	
Input Types	Universal; software configurable
-Voltage	- 0 to 10VDC (40kΩ input impedance)
	- 0 to 5VDC (high input impedance)
-Current	0 to 20mA with 249Ω external resistor (wired in parallel)
-Digital	Dry contact
-Pulse	Dry contact; 500ms minimum ON/OFF
-Resistor	0 to 350 KΩ. All thermistor types that operate in this range are supported. The following temperature sensors are pre-configured:
Thermistor	10KΩ Type 2, 3 (10KΩ @ 77°F; 25°C)
Platinum	Pt1000 (1KΩ @ 32°F; 0°C)
Nickel	RTD Ni1000 (1KΩ @ 32°F; 0°C)
	RTD Ni1000 (1KΩ @ 69.8°F; 21°C)
Input Resolution	16-bit analog / digital converter
Power Supply Output	15VDC; maximum 120mA (6 inputs × 20mA each)

Outputs	
Digital	24VAC Triac, digital (on/off), floating, or PWM; software configurable
	- 0.5A continuous
	- 1.0A @ 15% duty cycle for a 10-minute period
	- PWM control: adjustable period from 2 to 65sec.
	- Floating control:
	- Min pulse on/off: 500msec.
	- Adjustable drive time period
	External power supply
Universal	0-10VDC linear, digital 0-12VDC (on/off), floating or PWM; software configurable. Built-in snubbing diode to protect against back-EMF, for example when used with a 12VDC relay.
	- PWM control: adjustable period from 2 to 65sec.
	- Floating control:
	- Min pulse on/off: 500msec.
	- Adjustable drive time period
	- 60mA max. @ 12VDC (140°F; 60°C)
	- Minimum load resistance 200Ω
	- Auto-reset fuse
	- 60mA @ 140°F; 60°C
	- 100mA @ 68°F; 20°C
Output Resolution	10-bit digital / analog converter

Product Specifications (continued)

Wireless Receiver[3]

Communication	EnOcean wireless standard
Number of wireless inputs[4]	24
Supported Wireless Receivers	Wireless Receiver (315) Wireless Receiver (868)
Cable	Telephone cord
- Connector	4P4C modular jack
- Length (maximum)	6.5ft; 2m

Standards and Regulation

CE -Emission	EN61000-6-3: 2007; Generic standards for residential, commercial and light-industrial environments
-Immunity	EN61000-6-1: 2007; Generic standards for residential, commercial and light-industrial environments
FCC	This device complies with FCC rules part 15, subpart B, class B

FC CE

UL Listed (CDN & US)	UL916 Energy management equipment
Material[5]	Plastic housing, UL94-5VB flammability rating Plenum rating per UL1995

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Conformal Coating	
- ECB-203 with Environmental Protection	IPC-CC-830B / MIL-I-46058C
CEC Appliance Database	Appliance Efficiency Program[6]

ECB-253 Display

Display Type	Backlit-color LCD
Display Resolution	400 W × 240 H pixels (WQVGA)
Effective Viewing Area	2.4 W × 1.4" H (61.2 × 36.7mm) 2.8" (71mm) diagonal
Menu Navigation	Jog dial turn and select navigation with Exit button

Allure EC-Smart-Vue Sensor

Communication	RS-485
Number of sensors per controller	Up to 4, in daisy-chain configuration
Cable	Cat 5e, 8 conductor twisted pair
Connector	RJ-45

Communication Protocols

enocean®

1. External loads must include the power consumption of any connected modules such as an Allure EC-Smart-Vue sensor. Refer to the respective module's datasheet for related power consumption information.
2. Refer to Distech Controls' Protocol Implementation Conformity Statement for BACnet.
3. Available when an optional external Wireless Receiver module is connected to the controller. Refer to the Open-to-Wireless Solution Guide for a list of supported EnOcean wireless modules.
4. Some wireless modules may use more than one wireless input from the controller.
5. All materials and manufacturing processes comply with the RoHS directive ✓RoHS and are marked according to the Waste Electrical and Electronic Equipment (WEEE) directive.
6. California Energy Commission's Appliance Efficiency Program: The manufacturer has certified this product to the California Energy Commission in accordance with California law.

Total Quality Commitment

All Distech Controls product lines are built to meet rigorous quality standards. Distech Controls is an ISO 9001 registered company.

ECB-203 Series

05DI-DSEB203-18